Case Study of D02811: Animal Physiology

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# Introduction

Any programme of study must be systematically planned regardless of the mode of delivery. As a group we recognise that the end result of any programme should be the learning of our students. Hence this report will therefore critically evaluate the Animal Physiology unit (D02811) that is part of the Intermediate 2 Biology course. This report will focus primarily on the course structure and how this shapes the student experience.

As educators within a climate of globalisation it is imperative that we meet the demands and expectations of the student “customer”. It is becoming more evident that education is now within the realms of a competitive market where students can exert their right of choice and if “you do not have the product “that the customer wants they will go elsewhere (Weller, 2003). The growing diversity resulting from widening access and participation requires educators to adopt a flexible and learner-centred approach in order to remain inclusive (Mayes, 2007a).

In order to ensure a quality educational programme that meets students’ demands, it is imperative that there is continuous evaluation of the effectiveness of learning strategies and the student experience. Hence this is why the group has chosen to focus on the course structure and student experience of this blended learning approach.

# Overview of the course

This case study examines D02811 Animal Physiology - part of the Intermediate 2 (Scottish Credit & Qualifications Framework (SQA) level 5) Biology course. Learning outcomes cover

• Knowledge & understanding

• Problem solving

• Collection and analysis of empirical information

The curriculum is determined by the Scottish Qualifications Authority (SQA) and the method of assessment is fixed but delivery of the content is determined by the tutor.

The course is delivered on a full-time or part-time flexible basis to both school leavers and adult returners who wish to go to do access to Life Sciences and Sciences or to study Nursing. It is primarily classroom and laboratory-based but this year has been enhanced through use of a Virtual Learning Environment (VLE; Moodle) to provide access to additional online content including National Learning Network materials and support self-study. Units in IT, numeracy and communication skills are provided to full time students.

# Explanation and critique of the course in relation to course structure

The unit runs for twelve weeks and employs a blended learning approach; however delivery is mainly classroom and laboratory-based. The sessions include a range of teaching methods; small group activities, tutor-led sections, videos, revision sheets, work booklets, problem solving activities, formative assessments (quizzes, worksheets), reflection and experiments. The tutor states that she would like to use more collaborative activities and encourage students to conduct their own research into the subject area. Chamberlain and Vrasidas (2001) support this idea: learning becomes more interactive when learners are engaged in a variety of activities along with their peers and teacher and they become co-constructors of knowledge. Overall the course structure encourages engaged learning, “*…a collaborative learning process in which the instructor and learner are partners in building the knowledge base”* (Conrad and Donaldson, 2011, p.vii) and achieves a good balance between instructor-led and learner-directed activity.

The course was constructed according to the TESEP model (Transforming and Enhancing the Student Experience through Pedagogy; (Mayes, 2007a)) and aligns well in terms of learners taking significant responsibility for their learning; facilitating co-operative learning; and formative feedback. There is less evidence of an extended induction, to prepare learners by introducing them to the collaborative learning strategy. In addition, there is little emphasis on acquisition of digital literacy skills - although full time students receive IT training, this is not available to those studying part-time. The forum feature in the VLE (Moodle) was not used, and offers the only example of the use of web 2.0 technologies (Anderson, 2007) to foster active learning (Mayes 2007b).

Adherence to constructivist principles is evident:

* students are presented with alternative perspectives through group discussions;
* alongside assessments from the Scottish Qualifications Authority (SQA) National Assessment Bank (closed book and a written report based on a practical investigation), students self-assess;
* students learn collaboratively;
* video, animation and simulations are used to enhance learning
* students bring their own experience and knowledge to bear, making learning meaningful
* Lesson plans contain clear learning outcomes and descriptions of activities which make use of constructive learning approaches

Dewey (1916/1997) as cited by Conrad & Donaldson (2011, p.1) recognized that when the tutor acts as a facilitator in the classroom, the individual’s experience and collaboration with others can then contribute to the learning environment. By reducing the “chalk and talk” approach, “chunking up” the learning and introducing outcome-focused activities the tutor aims to achieve this. Individually and socially, students learn through activities designed to consolidate learning (e.g. formative assessments) and build confidence and community (by completing tasks in small groups and feeding back to the class). The unit is supported by a VLE (Moodle) for self-study. The online resources and tools available include a discussion board, links to each session’s PowerPoint slides, multimedia tutorials, interactive eLearning materials and a list of subject-related resources. Research is encouraged through laboratory experiments as well as use of the VLE to explore other resources and websites to extend the learning. Although lessons are organised to provide opportunities for individual and shared use of resources from the VLE, thereby blending the online and face to face elements, the tutor has not yet taken this role further by actively promoting collaborative learning online. She has not explained this strategy or provided collaborative activities online to demonstrate the strategy. She has not built the course with the phases of engagement in mind (Conrad and Donaldson, 2011, pp. 7-14) whereby students move from being newcomers requiring an induction, to fully engaged collaborative learners, co-constructing knowledge with their peers as community develops. This may disadvantage mature learners more used to instructor-led teaching.

The unit bolts on this online component to the primary approach which is classroom-based delivery. Nevertheless, the student feedback and outcomes suggest this is successful and more effective than the previous approach which made no use of a VLE.

# Explanation and brief justification for the key issue selected – student experience

Following a discussion by the group the key issue selected was the student experience. There was evidence of feedback from the students which was predominantly positive. However, the group identified that there were specific issues that could be addressed thus resulting in key recommendations to enhance the overall student engagement and experience.

# Critique of the course in relation to the student experience

The unit being examined uses a blended learning approach which from observation appears to favour a more traditional approach were the theory is delivered by face to face contact. Moodle, the VLE, is used to support the theory content with lecture PowerPoint slides and links for further reading to related subject areas.

Comments from student feedback in relation to this approach appear on the whole to be positive however there is evidence to suggest that some students felt this approach to be quite intense. The style of learning, depth and pace of learning appears here to be dictated by the lecturer. This is evident from comments including, “*very intense and they feel that it’s useful to have some background material*”. Further comments that reinforce this include,

“Students agreed that having Science all day Monday very difficult and dislike the fact that they have to come into college for 1 ½ hours on a Friday for communication as most of the time you are sitting reading through something which could have easily be done at home”

Perhaps a pragmatic solution to some of these problems would be to include more online blended learning that affords the student opportunity to learn at their own pace and style of learning. Biggs’ (2003) model of constructive alignment is based on the premise that students learn by constructing their own understanding, which to an extent will depend upon their own experiences, of which could be quite diverse in a classroom of school leavers and adults. Hence to engage students in their learning Biggs (2003) stipulates designing a unit where the students are involved in learning activities. There does appear to be evidence of group work, collaboration and activities in the Laboratory that centre around the theory work. However to give students ownership of their learning perhaps a more flexible self-directed approach which included classroom work, laboratory sessions and some work online including tutorial activities, discussion forums, formative assessments and simulations, might enable these students to adopt not only their own learning style but could also encourage new learning styles. Referring to Biggs’ (2003) constructive alignment, the modules’ learning outcomes should be clearly reflected in the modules’ learning activities and assessment strategy. Learning outcomes are evident in the lesson plans for this module but it is not clear if they are evident for the students to see as the PowerPoint slides visible to the students do not appear to outline any learning outcomes. Students need a clear outline of what they are expected to learn, expectations and level of commitment required and the timescale to afford them opportunity to become independent lifelong learners (MacDonald 2008). Perhaps an individual learning contract developed by each student would encourage self-reflection and afford them the opportunity to identify their own individual learning needs, allowing them to plan how and when they will achieve the learning outcomes. This would provide a pragmatic solution to enabling the students to achieve the module learning outcomes whilst embedding a more self-directed, student centred approach within a blended learning strategy.

To employ such strategy will require a degree of IT skills which this programme appears to have successfully embedded within the curriculum for full time students.

# Recommendations for future enhancements to course

The course structure could be improved by more integrated use of the VLE and other Web 2.0 tools. Use of the VLE could also be a vehicle for improving IT and information literacy skills (NHS Education for Scotland) to enable learners to become more independent in their ability, evaluate the quality of information sources, fitness for purpose and their ability to combine and apply knowledge to address key questions. The VLE could also be used for many of the individual and collaborative activities that are currently classroom-based, such as reflection, peer review, self-assessment as well as communication with and feedback from the tutor. Wider use of the VLE might also enhance the learning experience of students studying flexibly, who could otherwise become isolated – but since they do not participate in the IT unit available to the full-time students, diagnostic assessment of IT literacy skills and support would be needed.

Of course wider use of the VLE will mean additional demands on the tutor, particularly in the early stages of the course when more support and online interaction will be needed to familiarise students with the approach and to demonstrate and model the strategy. This would be encompassed in an extended induction. In addition, if students are to be assessed, rubrics for assessing participation in online discussions will be needed (Ko & Rossen, 2010). There is no evidence that these are in place.

# Conclusion

It is evident from the curriculum design, particularly the lesson plans, that the learning outcomes for this unit appear clear, demonstrable and measurable. However what is not clear is how accessible they are to the students. Learning outcomes should describe the student’s behaviour at the end of this unit. The unit does employ a variety of teaching and learning strategies to achieve the learning outcomes. The tutors endeavour to embed a combination of behaviourist, social and constructivist learning theories by using a combination of face to face contact, laboratory sessions, group work and problem solving sessions. Hence the group work and problem solving sessions support Selwyn’s premise that that human learning is highly explorative and the learner will construct new knowledge based upon their previous knowledge (Selwyn, 2011).

The tutor highlights the issue that the unit is assessment driven and the student feedback supports this, as students find the pace of learning intense and were often requesting further background knowledge. This might suggest that the students are forced to develop a more a strategic learning approach. However it is noted that this is a SQA level 5 unit that is preparing students for university. In preparation for lifelong learning, perhaps it could be suggested that by incorporating more technology into teaching in the form of authentic tasks and encouraging thoughtful reflection on experience that this could facilitate the learners exploration and construction of knowledge.

The development of learning contracts with the students could be employed to convey clearly the unit’s aims and learning outcomes but it would also give the students the opportunity to identify their own learning outcomes and give them ownership of their own learning.

Whilst a collaborative approach is evident for this course in classroom activities, there is room to create a more integrated collaborative approach in future iterations of the course by making better use of the VLE and Web 2.0 tools and by introducing an extended induction. The particular needs of part-time flexible study learners must be considered further. Whilst they stand to gain the most from such a change, they are more dependent upon the effectiveness of the online elements to support learning and development of community than the full-time students.

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